Nondipole Effects in Atomic and Molecular Photoionization

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Nondipole contributions to the differential cross section are important in atomic and molecular photoionization even at low photon energies of a few hundred eV and less. This is illustrated on the showcase example of N2 for both core and valence shell photoionization. Measuring the nondipole behavior also allows to gain deeper insight into molecular photoionization processes as it was used to identify a "Nearest-Neighbor-Atom Core-Hole Transfer" (NACHT) process in N2O and OCS, which can be seen as a molecular equivalent to the Multi-Atom Resonant Photoemission (MARPE) process in solids.